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PREPARATION AND USE OF THE CARREL-DAKIN ANTISEPTIC SOLUTION*

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During the past few months much has been written concerning the Carrel-Dakin antiseptic solution which is being used so extensively in wound sterilization in the war zone. Remarkable results have been obtained. The surgeons of our own country find that this solution is of equal value in open wounds encountered in civic life and in the industries. We have been using the preparation in our local hospitals for the last eight months and have obtained some remarkable results.

In the numerous articles that have appeared in our journals on this subject great stress has been laid on the methods of application. Dr. Carrel says that 40 per cent. of its value depends on the care that is used in its application. Not so much has been written concerning the technique of its preparation, which is of no less importance. Very briefly I wish to mention the formula and points which must be observed in order to obtain a solution of greatest value.

This antiseptic is an aqueous solution of sodium hypochlorite of a concentration not less than 0.45 per cent., no more than 0.5 per cent. Clinical experience proves that under 0.45 per cent. its bactericidal effect is not the best, and over that it is irritating. The formula that laboratories have found to give a solution nearest correct is the following:

Chlorinated lime	200 gms.
Sodium carbonate	80 gms
Sodium bicarbonate (dry)	100 gms.

Our laboratories have found that the majority of brands of commercial chlorinated lime contain not 33 per cent. of available chlorin, as is official, but from 24 to 25 per cent. Of course, if the lime has a higher percentage of available chlorin than 25 per cent., a smaller amount of lime must be used.

Put into a twelve liter flask the 200 gm. of chloride of lime and five liters of ordinary water; shake vigorously for a few minutes and leave to macerate for five or six hours.

At the same time dissolve in five liters of cold water the carbonate and bicarbonate of soda. After the maceration of the lime mix the soda solution with it and shake thoroughly. Leave stand until the calcium carbonate which is pre-

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cipitated is settled out. Siphon off the supernated liquid and filter. This liquid is the finished product.

On account of the variation of commercial products, it is best to standardize the finished product. This procedure is one that any druggist of technical training can do. Our laboratories have checked up products prepared by our local druggists and have found them very satisfactory. For an explanation of the technique of the standardization, I shall refer you to the December number of the *Southern Medical Journal*, 1916, or the December 2nd number of the *American Medical Journal*

Action of the Solution: How does this solution act as an antiseptic? How strong a bactericidal agent is it? Why is it a better antiseptic than Labarraque's solution, which many of you used so extensively a few years ago? How does its action differ from alcohol, bicloride of mercury, peroxid of hydrogen and other antiseptics, are questions which are interesting to all of us.

We are frank to say that we are not definitely able to state wherein its bactericidal power lies. It has been proven to the satisfaction of many chemists and bacteriologists that its action is due to two substances. Sodium hypochlorite is a very unstable compound. When it comes in contact with the carbonic acid of the necrotic tissue nascent chlorin is liberated which in turn reacts with the water of the tissues, liberating nascent oxygen, which is a very active oxidizing agent, destroying the bacteria by the simple process of oxidation.

Some of the salt is not broken down until it has well penetrated the pus and necrotic tissue, as it must come in contact with carbonic acid before the nascent oxygen is liberated. This preparation acts as a bactericidal agent just as the chlorinated lime acts which you use in the sewer. It is an antiseptic of high bactericidal activity and of little toxic and irritating quality. It has marked pyocytohemolytic power, being able to dissolve pus, blood-clots and necrotic tissue. The living tissue is not affected by the solution.

It differs in its action from hydrogen peroxid inasmuch as hydrogen peroxid is so unstable that its oxygen is liberated before the solution penetrates very deeply.

It differs from Labarraque's solution inasmuch as the latter is alkaline in reaction, which neutralizes the carbonic acid, thus preventing the liberation of the nascent oxygen.

Its action differs materially from alcohol and mercuric bichlorid, as the action of the latter two is that of destroying the bacteria by coagulation. At the same time the pus and tissue debris is coagulated, interfering with drainage. Part of the antiseptic power of this solution lies in the fact that hypochlorite coming in contact with protein material forms complex compounds known as chloramins, which have marked antiseptic properties. It is upon this principle that Dr. Dakin has prepared his so-called chlorazene antiseptic tablets, which can be bought on the market at the present time. These tablets are stable and from them the antiseptic solution can be made. However, for hospitals the solution made up from the chemicals as has been described is much more satisfactory, as it is much cheaper. The actual cost of the material used in the solution is about twenty-eight cents for five gallons. Where a laboratory is accessible the time spent in the preparation of the solution is not very much.

Application: Concerning the technique of the application of this solution, as carried out by Dr. Carrel, you have no doubt read the extensive articles that have appeared in the *American Medical Journal, Journal of Surgery, Gynecology and Obstetrics, Southern Medical Journal* and others. The preparation has not been used in this country very much, but where used it has proven that the technique is just as applicable to the treatment of wounds encountered in civic life as in war.

Dr. Noland, the chief surgeon of the Tennessee Coal and Iron Railroad

Company, says that in his service the use of mercuric chlorid, iodin, iodin and benzin, alcohol and similar antiseptics for the early and late treatment of wounds has been entirely abandoned and all classes of open wounds are treated with Dakin's solution.

Fresh wounds are cleansed with gauze soaked in the solution and all minor wounds are put up in wet dressings of the same. This dressing is thoroughly moistened every two hours, by the patient if he is treated in his home, or by the nurse if he is treated in a hospital. One precaution which must be taken is to see that the skin surrounding the wound is protected with vaseline, as the antiseptic is irritating to the skin. Burns of all degrees are treated in exactly similar manner. More serious and deep wounds, especially those involving bone and joint, are treated by the instillation method.

We have found in our experience with the solution for the past eight months that infected wounds, even where deep-seated cavities are involved, are quickly sterilized if the technic is carefully observed, i. e., if the tubes are so arranged that every portion of the wound is reached at two-hour intervals. We have had several cases of hands that have been severely torn and lacerated and severely infected, which under the treatment have healed with wonderful rapidity and with a small amount of scar formation.

From my experience with the solution and from the experience of some of my colleagues I have been convinced that we have obtained results which we never have been able to secure with other antiseptics.

Discussion.

Dr. A. A. Will, Oklahoma City: Gentlemen, I believe that one of the reasons why the Carrel-Dakin solution has not become more popular with the surgeons over the United States is the fact that it was really a chemist who brought this solution to our notice, and we have a great many skeptics at present who continue to question its value. I believe they are skeptical because—not because they don't know the technique or don't know that the solution is perfect—but because they have not given the solution a trial in the selective cases.

I heard Doctor Bevan last year, or saw him present a number of cases of badly infected limbs. At the time, I believed that Dakin's solution, as an antiseptic, would never become very popular. The cases he showed were infections and contused wounds of the limbs, using the drainage tubes, hot bags of salt solution, bichlorid, the active use of iodin; and in some of the cases they used the Dakin solution. At that time, if you will remember, Dakin's apparatus consisted of a container with a large tube running down and several small tubes going into the wound, the wound closed. Now, the trouble with that apparatus is that we don't know how to use it. These small tubes lead down deep into the infected wounds and there is no way for the solution to return—it simply remains in there and dissolves the pus and there is no way for the solution to pass out. Major Davis, who was in the First British Unit and had control of the base hospital, from Chicago, told me a year ago that he did not believe Dakin's solution would prove of great value in the war zone, for the simple reason that the technique was too complicated, and he used a large bottle—not a Dakin solution, but practically the same thing—I haven't the formula, I have forgotten it. This bottle could be used in the evacuation hospital at the front. The soldier was given this bottle with two tubes, one ingress and one leading out—every hour, every half hour, every two hours, if necessary. This syringe that was given them was placed in the mouth of this large bottle which contained the solution—simply take the clamp off of the end of the tube entering the wound and inject three or four ounces of that solutoin—simply passes through and passes out the other tube. Now, that was the procedure carried out by the wounded men coming from France to England, or from the evacuation hospital to the base hospital at that time. Since that time I understand Major Davis has been

more or less convinced that the same procedure can be carried out with Dakin's solution and better results obtained.

The use of Dakin's solution in the chest conditions as we have used it at home, and I suppose that that was taken from the war service, a simple tube is put into the chest proper; the Dakin solution is put into the cavity under pressure; your solution is allowed to remain there a few minutes; no matter how thick that material may be the first time, you aspirate the chest. You may get very little material, but after two or three injections of the Dakin solution your material passes out easily. Now, then, to do this with a degree of ease they simply have this vacuum pump, and each time the Dakin solution is put in it is allowed to remain a few minutes and withdrawn. Every day a bacteriological count is made and kept. The few cases I have treated at the hospitals have done remarkably well. Now, then, if we could say the Dakin solution does nothing more than have a certain effect on these patients whereby they do much better and that it does away with a lot of the odor, which the saline will not do—you remember how disagreeable it became to the patient and everyone surrounding him—it has served a useful purpose. That is one thing Dakin's solution does do—it clears up that odor. In using that solution a method of treatment is carried out every two hours and it is gradually lengthened out as the bacterial count grows better. When it gets down to where the bacterial count is practically nil, you simply close that cavity. We use following the Dakin solution, or where we are sure the cavity is practically, a form of formalin and glycerin solution and fill the cavity remaining and close the wound. I don't know what the experience has been in the war zone of the complete healing of these cases, but we do know some of them come back and have to be reopened and cleared up, and we do know the use of the glycerine solution following this, and using the straight chlorin solution to simply finish up the job, has certainly simplified the treatment of empyema of the chest.

I have had a small experience in treating, and I suppose all of us have treated tubular stricture of the rectum, which is one of the conditions we all side-step; and the great trouble has been, and will continue to be, that following dilation more scar tissue forms. I used all the other antiseptics and stimulation solutions, but in the very few cases I have tried Dakin's solution in, it does heal that stricture—heals that lining membrane—with less scar tissue than you have ordinarily, so that we are getting some results in the treatment of these cases, and it clears up the pus. I use a return catheter for the solution and it works out very nicely.

Just another reason why Dakin's solution has not been more popular. That is the fact, as Doctor Smith has said, that the proportions have to be exact. Now an apparatus has been made whereby a doctor, in his private practice, can use it by making up his solution. This apparatus I think will be inexpensive and the solution is certainly much cheaper than anything else we can use. I really believe it lessens the amount of scar tissue; it apparently does in large surface wounds. All in all, I am like Doctor Smith—I believe I am thoroughly convinced, and that is only in the past year, that Dakin's solution is going to prove of considerable value to us in the treatment of all suppurating wounds.

Dr. A. Ray Wiley, Tulsa: My personal opinion of this Carrel-Dakin solution reminds me very much of a star shell. It goes up, flares, throws out a little light, settles down in its own niche and stays there. It was my good pleasure to work in the Rockefeller Demonstration Hospital at Rockefeller Institute during the winter of nineteen seventeen and spring of nineteen eighteen with Major Stewart and Lieutenant Sullivan, and those of you who have been there will know these men. I worked at the right-hand of Carrel and had every opportunity to observe the way the solution was made and the results they got—and I will say that they did get some results—but, it is a most tedious and laborious thing—most tedious and laborious technique and very expensive in any ordinary

institution. Rockefeller can afford it, but the ordinary institution cannot afford it—not in the manner of making your solution, not in the manner of making your medicine, but in the number of nurses and assistants it takes to handle the technique and in the number of persons it takes to make the changes in changing the dressings. For instance, the ordinary technique: That the injection has to be made every two hours. If the patient is capable of making that injection himself, all well and good, but a majority of them are not and it takes the nurse, or whoever the assistant is—it requires them to be on the job every two hours, day and night, and it takes lots of assistants in making the change every twenty-four hours. We had there about six nurses to each surgeon, only making the change in the dressing. One of them handled this and one of them handled that, and somebody else something else. They got in your way most of the time, but nevertheless, that was the instructions.

The great virtue I found in the use of the Dakin solution is very similar to what Doctor Will said here. I have treated four cases of empyema with Carrel-Dakin technique in my private practice. I used it with two of them as the Doctor has utilized it, and that was in those chronic empyemas. One of three years standing, and the other of eight months standing. Those two were treated with ordinary Dakin solution. The one of three years standing was healed up in three months and the one of eight months standing was healed up in one month. The other two cases I used the chlorazene and got good healing in both cases.

Doctor M. Smith says regarding the manufacture of the solution, that all limes do not contain the same amount of chlorin; that it is easy for a person who has not had a laboratory to make up that solution. How are you going to determine how much chlorin you have in your lime solution if you don't have a laboratory to analyze your lime?

Another thing, Dakin's solution is subject to rapid deterioration and changing, so it should be analyzed at least every twenty-four hours if you are going to get good results.

Another thing, it has a certain applied place. You cannot try anything and everything with Carrel-Dakin, nor Dakin never expected that. It has been unjustly criticized because the men who have taken it out have tried to treat everything with it and, naturally, did not get the results they expected. That is their fault and not the fault of Carrel or Dakin.

It must be used in proper technique and according to the men who have had experience with it, and if you don't use it according to their technique you will not get the result they get. But, for practical purposes, I will say that it can only be used in a large institution with a corps of workers and assistants who do know the technique and who keep it in proper condition every day and know what they are doing. It cannot be used in the ordinary hospitals in smaller communities.

Dr. J. S. Hartford, Oklahoma City: We always have the man who is conservative to check the man who is over-enthusiastic, and that goes as a safeguard in our lines of treatment that are new and possibly not well settled. In the clinic at the University of Oklahoma we have quite a large number of pus tubes. Sometimes it is a question whether or not we drain. Most cases we do not. Quite a number of those cases have been followed by infection. We have had some nice results by Carrel-Dakin solution in the treatment of those cases, but the question of a few cases is not the thing. The question of a hundred cases or the question of a thousand cases is not the thing. We must put alongside the positive thousand cases another thousand cases that have been treated by some other method, and then we must compare those two. A report of two thousand cases is not right unless you put another two thousamd cases alongside, operated by some other method and compare them. I heard Vaughan, at the Congress of Clinical Surgeons, in summing up the treatment of wounds. Vaughan went on to say that the Carrel-Dakin solution was impractical in warfare; then he

took a series of cases that had been treated by Carrel-Dakin and a series treated by other methods and he compared them, and he wound up in such a beautiful way—I presume he did this because of the fact that a representative of the Surgeon General of the French Army was present at this meeting. He wound this paper up in such a beautiful manner that it appealed to me. He said, "In our experience the best results have been obtained in the cases in which it might not have been used".

Dr. Ralph Smith, Tulsa: It so happens that I have been situated for the past nine or ten months where I have seen some cases treated by the Carrel-Dakin method. Like all other remedies, if used properly and in the proper class of cases, it is of value. There are those who would have us believe that it is the most excellent treatment for all classes of wounds. I want to sound warning right here. You are standing on a false bottom. I have seen many cases treated by the Dakin method. My first training in the use of the Dakin method was in France, where I was located in what is perhaps the best equipped American hospital in France, and surgeons are sent there for instruction in the use of the Carrel-Dakin method and the practice of war surgery. They used the Dakin method almost exclusively in that hospital. The technique was beyond criticism. However, the best results in the treatment of these wounds are following the Dakin method in connection with the De Page and Chantreau method, which is mechanically cleansing. When you stop to consider that the Dakin solution is only effective for two minutes or less after it comes in contact with the wound, you will readily understand that two hours is too great an interval. Carrel statistics were taken from a series of cases in what is considered a very small hospital, possibly enough to receive seventy-five or eighty at the best. He had a corps of trained assistants and nurses and had expert laboratory men to use in the preparation of the solution, so that he did get excellent results. The point of the essay hinges upon one sentence. That is, that the solution must come in contact with all parts of the wound, which is practically an impossibility. The wound is an open cavity, in a vast number of these war cases, which perhaps represents five inches in diameter and capable of holding a pint of solution, or more, and yet with walls collapsed it would have in it a few tubes and thought to have been Dakinized, and I have taken them out and found a little channel following these tubes, and the solution is following the tube right out to the surface. Now there is one practical way you might get the solution to all parts of this wound, and that is by packing the wound wide open with gauze. Now, what are these half dozen tubes going to do with this large wound with collapsed walls? Simply pack that wound and put your Dakin tubes around the outside of all your packing and you may get your solution in nearly all parts of this wound, but not all. Take compound fracture cases, eight, ten or twelve weeks standing, and they are still sticking Dakin tubes in there, and imagine their getting results. Where is the source of the pus? Maybe five inches from the end of the tube. And then, when you do your secondary operation and remove these sequestra, then you can Dakinize again with hope for success. It is a good treatment if properly carried out, but it is almost an impossibility. I believe it is a delusion. I remember one occassion in particular. We had two quite similar cases. One had the tubes in and had plenty of gauze packing, and the other had a wound and no tubes in his wound—his wound being packed wide open and never had had Dakin's. I have seen those wounds clear up and ready for secondary closure in six, eight and ten days. I have seen them without a Dakin tube in them and have seen the man next to him with the Dakin tube, so you cannot figure it all from the Dakin solution. It is good, but it is hard to apply, and its technique must be absolutely perfect. The minute that piece of shrapnel goes through the clothing and into the flesh you have an infected wound. After the first dressing is applied the next, perhaps, will not be for three or four days and you will have some pus present.

I expect to use the Dakin solution, but it must be especially prepared. It

is irritating, even in the weaker solution. Carrel says the vaseline is unnecessary, but it is necessary. It should be protected and I have seen some very serious results because they didn't begin using the gauze early enough. At Fort Des Moines I have seen the Dakin method carried out in the most minute form, and that was by a surgeon trained in the Rockefeller Institute and the army hospital at Washington. We, over here, have no conception of what real infection means. It is a foolish idea to think you can clean all wounds with Dakin solution.

Dr. A. L. Blesh, Oklahoma City: Let us go back to first principles. It was not very long ago that we thought a wound could not get well unless it was dressed every few hours—meddlesome surgery. However, it wasn't long until we found out that meddlesome surgery was just as bad as meddlesome midwifery. Every time a wound is dressed, it is immaterial what antiseptic is used, a risk of infection is incurred. Mechanical sterilization is the greatest of all antiseptics—the load the tissues have to carry is thereby reduced.

Secondary hemorrhage in the use of the Carrel-Dakin solution is not uncommon. The chlorin has the power of decomposing animal ligatures, thus necessitating the use of non-absorbable material for ligatures. This in turn predisposes to the maintenance of the already existing infection.

I am not opposed to the Carrel-Dakin solution where the facilities and the trained personnel are at hand for its proper use; but maintain that with the average man, in the average little hospital, in the way it is ordinarly used, it is worse than a failure, because the surgeon in relying upon it is leaning upon a broken reed. It will not take the place of good surgery, and where good surgery is practiced it is seldom needed. Of course, it is understood that its use in any hands necessitates frequent meddling with the wound which as a principle is bad. Meddlesome surgery is fully as bad as meddlesome midwifery. It takes an expert to be able to meddle with wounds frequently, and keep out of trouble. Believing myself, that I am not expert enough to do it, I haven't the hardihood to meddle much with the wounds under my care.

Dr. M. Smith, closing: I have never read a paper in my life that gave me such supreme gratification as this one has. We all very well know that when a paper is read and everyone present agrees with the paper, that it does not amount to much. The different ideas expressed in this discussion are beneficial to me, especially from men who have had, I might say, unlimited experience in the use of the "Dakin solution", which enables you to parallel your various experiences, keeping me out of the enthusiastic rut that we so often fall into. However, in regard to Dr. Blesh's discussion, I think we are aboslutely in hearty accord with the one subject—namely: dressing of wounds every few hours. I know, and Dr. Blesh and every surgeon in this house knows, that the less you disturb a wound the better it is. This is prima-facia evidence and needs no argument. When you have a clean wound, and make a septic wound out of it, you are responsible for the results. In this instance in the Carrel-Dakin solution, you have something that will come to your rescue and help you out, which it will do if you use it judiciously.

This paper was not intended for anything but dirty, septic, infected wounds or cavities in any part of the body, and not for fresh wounds, unless we have reason to believe they are septic.

I have foot-notes as to what the leading surgeons on the war front have to say after a number of years experience as to the efficacy of this solution. We all know that clean surgery is good surgery. Dr. Blesh mentioned in his discussion the effect that this solution has on various kinds of ligatures, causing them to be dissolved or macerated, and very conducive to secondary hemorrhage. This, in a measure, is quite true no doubt, but I might say that under those conditions it may have possibly been due to the slough and not altogether to the bad effect of the solution on the ligatures.

I read with a great deal of interest in the *American Medical Journal*, eight or ten months ago, an article by Mr. Monyhan, giving in detail his experience with the "Dakin solution", and he sums it up by saying "that they probably would have done just as well without the use of it"—instead advocating the various other so-called antiseptic solutions. This, I think, was a matter of personal experience, and not a general denial.

I was also very much interested in Doctor LeRoy Long's discussion, and fully agree with him that it is necessary in all lacerated wounds to remove all of the tissue that has been devitalized and established drainage, thereby endeavoring to lessen the probabilities of infection by doing clean surgery. My experience with Dakin's solution in fresh wounds has been limited, but very satisfactory, preventing, as I believe, infection of various kinds by keeping the wound aseptic. However, it is hard for us to know just how much tissue to remove in badly lacerated or crushed wounds, knowing the shock of the tissues may extend far beyond what we may consider healthy tissue, lowering its resistance and especially conducive to infection.

I was also interested in Dr. Ralph Smith's discussion. In this paper I am going to pay special attention to it. I am not an army surgeon, and the one regret of my life is that I could not be. Certain things come up in our lives that we cannot help, even though we may want to do them. I tendered my services to my country and the saddest time of my life was that the line of demarkation had been established and the "die was cast", consequently I could not go. I would not send my boy or your boy any place I would not go myself. It makes little difference what becomes of me, but our boys must be cared for.

I will now read you a paragraph from Hughes and Banks War Surgery, page 302, as follows:

"During a rush it is impossible for a surgical specialist at a casualty clearing station to excise and deal with every wound, and of necessity he has to evacuate to the base hospital cases which in quieter times he would certainly retain. Of the rushes on this front we can give the valuable information that in *every case, however grave, in which the Carrel-Dakin treatment, very imperfect as it was in some cases, had been started at the casualty clearing station, not a limb or life was sacrificed: but in many cases which appeared at the casualty clearing station to be of minor importance, and were therefore evacuated without the Carrel-Dakin treatment, gas gangerene had supervened by the time the base hospital was reached, and both limbs and lives were lost.*"

Now, in your personal experience can you work out a treatment more satisfactory than that? I do not claim it a panacea for all wounds—there are cases that it will not benefit. There are cases that diphtheria anti-toxin does not do any good.

I want to say a few words in regard to the method of use; it must be used judiciously and systematically. Have your drainage tubes so arranged that the solution will come in contact with every recess of your wound, and in from twelve to thirty-six hours after its use, even though you have experienced sloughing and a very offensive odor emanating from the wound, or cavity, you will have the pleasure when you enter the room of your patient of being relieved from unpleasant odors of decomposition, to that of a mild chlorin inhalation. Now, can you do this with drainage, salt solution, boracic acid solution, bichlorid solution, or in fact any other of the various solutions you may choose? I answer emphatically, No.

Question by Dr. Ralph Smith: How about several thousand cases treated with dry gauze?

Reply: I am glad you asked that. When you do clean surgery that is a different proposition. I did not read this paper on fresh wounds—it was not the intention, but you got off on it, and consequently I must answer it. Clean sur-

gery, with normal resistance power of your patient, does not need any solution, and the several thousand you mention, seems to come under this head.

I can hardly close this paper without calling your attention again to Hughes and Banks War Surgery, page 322, as follows:

"We would like once again to emphasize the important observation, taken now over 2,000 consecutive cases of severe wounds, *that in all cases, however gross and severe, especially compound comminuted fractures of the femur and the like, where Carrel's treatment had been commenced early at the casualty clearing station, limbs and lives were saved: But in all cases where rush of work prevented the Carrel-Dakin treatment from being carried out, such limbs were gangrenous by the time the base hospital was reached, and had to be sacrificed, and in a considerable number of cases lives were lost.*"

"We cannot overestimate the immense importance of a system of continuity in treatment; for today, when we see extensive compound comminuted fractures of the femur, which a year ago would have been submitted to amputation, united and healed and the man up on crutches at the end of six weeks; cases of severe compound comminuted fracture of the humerus with union and good function at the end of five weeks, etc., it gives much ground for reflection. By the regularly organized standard method of wound treatment where continuity can be kept up, we are not only saving life and limb, a very important point in the economy of any army, but we are also saving much subsequent expense to the State."

During the recent epidemic of influenza there has been a number of cases of empyema treated by simple trocar puncture, drainage tube inserted, and Dakin solution injected into the cavity with a 20 c.c. glass syringe, and immediately syphoned out by a suction apparatus the nose and throat men use for taking up the mucous and blood in the throat during operation. This is repeated every two to four hours during the day, and in every instance marked improvement has been quite apparent in two or three days.

Instead of resecting a rib or ribs, as we used to do, we now under local anthesia, insert a tube as above described, with much more satisfactory results, it being very exceptional now that we think it necessary to subject our patient to the rib resection.

Dr. Hartford spoke very nicely regarding its use in gynecological work with offensive leukorrhea discharge, for which I thank him.

Now in conclusion, we will ask again, What is the ideal antiseptic? It must possess the following properties:

(1) It must be a highly potent bactericide.

(2) It must be innocuous to sound tissue, but must rapidly remove dead tissue and sloughs.

(3) It must be non-poisonous to the individual when applied in large quantities to an extensive wound.

(4) It must be innocuous to leukocytes and not delay their functions.

(5) It must act in the presence of serum or wound exudate.

(6) It must not delay, but rather hasten, tissue repair.

(7) It must be an antiseptic which will help the patient for the first few days following his injury, and not rely upon the patient helping himself.

(8) It should be cheap and must be easily prepared.

Again thanking you for the discussion and assuring you of my most sincere appreciation of same.

OVARIAN FUNCTION*

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The history of the study of the ovary has been one of the most interesting in medical and surgical research. This study has been greatly stimulated in the last decade, since the dire results of ovarian castration became well established. In the earlier days we thought of the ovary only as it referred to menstruation and the propagation of the specie. Through the study and the experimental research of Loeb, Fraenkle, Ancel, Bouin, Marshall, Robert Myer, Shroeder, Martin and others, we know now that the ovary has a dual function, and that the function of life is possibly not as great as the glandular element that influences the entire physical, nervous and psychical make-up of women, and it is the latter function we wish to emhasize in this paper.

The sexual and child-bearing function of the ovary has been well established for a long time. We know that following the rupture of the graafian follicle carrying the ovum, that the phenomena of menstruation follows, caused by some chemical substance not well known. It has also been fairly well established, that preceding, during and immediately following menstruation, pregnancy is most likely to take place. Removal of the ovaries will stop menstruation, followed by sterility.

Recently, some very interesting studies have been made, showing that the height of sexual desire in women, precedes, accompanies and immediately follows menstruation, with a secondary curve midway between the period. Thus we see that the greatest period of sexual desire is synonymous with and immediately following the rupture of the graafian follicle. The dual functions of the ovary are not well separated, and we see them closely related in many instances, namely, we know that the pregnancy will not develop unless there is a corpus luteum. The corpus luteum extract of the market is usually selected and made from animals that were pregnant when slaughtered; the corpus luteum from sows and cows giving one of the most reliable preparations.

The portion of the ovary containing the glandular secretion has not been entirely classified, but is presumed to come from the interstitial portion. But for us the consideration of the elements is sufficient, which consists of the graafian follicles and their contained ovum; the corpora lutae originating from degenerated graafian follicles.

It appears that the harmones of the graafian follicles are not alone the origin of the secretion, as there appears to be sufficient secretion in the child to cause growth and development of the genitals, up to the time of puberty, when the ripening of the graafian follices stimulates menstruation and sexual life, and at this period the breasts begin to develop. If the ovaries are removed before puberty there is lack of development of the genitals and probably mal-development of the body with absence of the sexual nature. Steinbauch, in his experiments with animals, has proven that the interstitial portion of the ovaries is responsible for the genital development, and that when ovaries were transplanted, the genitals continue to develop and the sex instincts were present.

Ovarian secretion has some relation to the other secretory glands. Castration of young animals causes slight enlargement of the thymus and hypophysis and decreases of weight of the adrenals.

Oophorectomy causes certain metabolic changes in the body, osteomalacia is favorably influenced by removal of the ovaries, and usually there is an increase in the weight of the body. Loewy Richer reports that the removal of ovaries in dogs caused a marked decrease in the consumption of oxygen. After a few

*Read in Surgical Section, Annual State Meeting, Muskogee, May 21, 1919.

weeks, ovarian extracts fed to these dogs caused them to assume, not only normal oxygen intake, but caused them to use an increased amount of oxygen. The above experiments and observations point to a specific influence in the body metabolism.

There are a chain of general symptoms which gynecologists report in their patients after the removal of the ovaries, and which are many times associated with the natural menopause. These symptoms have not been regularly classified, but in a recent article by Richardson of Baltimore upon "The Effect of Hysterectomy Upon Ovarian Secretion", he has outlined a tenative classification, which he divides into two divisions:

First: Symptoms from the domain of autonomous nervous system:

1. Vasomotor—Hot flushes; headaches; dizziness; vertigo; fainting; dermatographia; urticaria; erythemata; cold hands and feet.

2. Cardiac—Palpitation; tachycardia; (mild, with normal heart).

3. Gastro-intestinal (motor and secretory)—Digestive disturbances with flatulence; eructation, nausea and occasional vomiting; stasis; meteorism; constipation; diarrhea.

4. Urinary—Irritable bladder; polyuria.

5. Endocrine—Thyroid; hyper- and hypo-function; pituitary, e. g. hypotension; gonads, e. g. voice; body conformation; countenance; facial hair; breasts; external genitalia.

6. Sweat glands, e. g. sudden sweating.

Second—Psycho-neurotic symptoms:

1. Psychic—Fatigability (mental and psychical); emotivity; hypersensitiveness; irritability; changed temperament; anxiety and apprehension; insomnia; excitability; hysteria; psychoses; depression; apathy and indifference; lack of energy; impaired memory; aphasia; indecision; self-condemnation; suicidal ideas.

2. Neurotic—Exaggerated reflexes; tremors and epigastric quivering; visual and auditory disturbances; lowered muscle tones; paraesthesia.

You will find from the above classification that you will be able to place most any case, and some cases will present the entire symptom complex. I wish to call especial attention to the skin manifestations coming from ovarian hormones. Dutoit has recently written a very interesting article showing the effect of ovarian secretion upon the skin. The effect upon the genitalia of ovarian castration is very marked upon young women or those in child bearing period. The labia majora and minora becomes rapidly thinned out and contracted. The opening of the vagina becomes atrophied and hard, many times resembling krausosis.

I believe that with present knowledge of the functions of the ovaries, and the chain of symptoms that follow their removal, that they never should be removed, only for the soundest pathological reasons, either before or after the menopause, and if they are removed, their loss should be compensated for by the transplantation of sections of the ovary in the abdominal wall, broad ligaments, libia majora or some location where the blood supply is good, and the careful administration of corpus luteum extract over a long period.

Discussion.

Dr. M. Smith, Oklahoma City: This is quite a change from the heated discussion on the "Dakin solution", to the high altitude of the ovarian function. I was very much interested in the paper, and Doctor asked me to open the discussion.

I think there is a great deal in connection with the glandular system that we are now upon the verge of knowing something more about, but as yet, we

are still to a great degree groping in the dark, and it is not only an interesting subject, but a very deep subject, and the more we study it the more bewildered we become.

When a female child is born, according to some of our best text books, there are three hundred and fifty thousand ovules in the ovaries; this may seem incomprehensible if you will stop to think about it. I have had occasion recently to look up some literature on this subject, and noticed one very striking to me where a male was castrated and their grafting a portion of the ovary into the sack, and that instead of the male going on and developing, as he would have naturally done, he developed the feminine characteristics instead of the rough characteristics of the male. Instead of the hair of the head and pubes assuming the coarse rough nature peculiar to the male, it had a soft, velvety feeling that naturally appeals to the instinct of any man.

I was very much interested in the effect of the irritated bladder. A number of years ago, probably twenty-five—I do not remember exactly—I had occasion to remove some ovaries for an irritated bladder. I tried everything under the sun to give relief, finally in desperation I advised abdominal section. On opening the abdomen, I found what we would not call a pathological ovary. I removed those ovaries, and in less than four weeks the woman who had recently been incapacitated for a number of years before the operation, was doing her own washing and ironing and working in the field with her husband every day. This is only one of the several experiences that I might recite. I think physiology teaches us that there is a secretion in the ovary that is absolutely necessary for the development of the child on up until puberty has been attained.

I have had some cases where they menstruate after I have removed the tubes and ovaries—this is not a true menstruation, being only nature's way to relieve the pent up nerve energy—the true menstruation only occurs with ovulation and rupture of the graafian follicle, etc.

Another important point made by the essayist was to consider removing the ovaries before puberty, or even after, unless the pathology was in a measure sufficient. To attempt to rob a woman of her true womanhood is taking from her the most sacred of all her inheritage.

In Philadelphia in 1918, I had the pleasure of attending a clinic of Prof. E. E. Montgomery, who is pronounced the greatest gynecologist in the world. I saw him transplant the ovary in an abdominal wound at several different clinics. Also Dr. Bland, whose ability is beyond question, gave a beautiful operation, removing the transplanted ovary from the abdominal wound for cystic degeneration that he had transplanted four years before. The moral of this transplantation was very apparent to the gynecologist.

Dr. Hartford, closing: I thank the gentleman for the discussion and there are a few points brought out in the discussion I think it is well to consider. One point is that menstruation does not follow after the ovaries have been removed. There has been a great deal of experimental work along this line. For instance, the fellows who have the idea about the value of the corpus luteum figure that if the corpus luteum is a good thing to stimulate the ovary it ought to produce menstruation. If it is responsible for the bringing about of menstruation, or the feeding of it, it ought to produce menstruation. There is only one record or instance of that that I have been able to find—one man that claims he has removed the tubes and that those tubes are now in the hospital as entire specimens, and that following the removal of these tubes and ovaries this woman was fed corpus luteum and menstruation was established, which was brought about over a period of time. Yet I still have a doubt and question that particular thing, because there may have been supernumerary ovaries. There may be a portion of ovary left in the ovarian ligament, where it was tied off at the time of other operations. This is always a point it is good to follow—the ovaries should

be tied off as far as possible and not injure the ovarian circulation—that is sometimes responsible for the mal-secretion of the ovary and for the condition that follows. I feel that the skin manifestation is an important field.

The question of the corpus luteum extract as compared with the testicular extract, which was advocated some time ago, shows there is a difference in the two glands. That is, that the ovarian tissue does contain a glandular substance that is necessary in the make-up of the woman.

As regards the question of passion, where the ovaries have been removed, that has always been a question. When you suggest to a woman that you expect to remove the ovaries there is always a question in her mind whether she will be able to perform the family duties as she did previous to that time, and it is a true fact, as was brought out in the discussion, that a certain per cent. of these women will have an excessive sexual desire after the removal of the ovaries, which we have not been able to account for, but Richardson, in his discussion of the removal of the uterus and leaving in the ovaries has brought out the point that where a complete history in that type of cases was kept fewer women had normal desires along that line than did those where the ovaries were left. Now, we must understand and cannot forget that even in women who never have had any disturbances to the ovaries—never had any operative procedure whatever—that there is a vast difference in the sexual desire and sexual appetite, if you please, so that on that question we are not sure.

EXFOLIATIVE DERMATITIS.

A case of exfoliative dermatitis, terminating fatally, due to arsphenamin, is reported by J. R. Latham, Camp Jackson, Columbia, S. C., (*Journal A. M. A.*, July 5, 1919). The death followed the intravenous injection of 0.8 gm. of arsphenamin, and the case bears the stamp of arsenical poisoning. The patient, in a routine examination, gave a positive Wassermann, but there was no other evidence of syphilis in the history or examination, and his physical condition was excellent. The first injections of 0.4 gm. arsphenamin caused so severe a reaction that he was sent to the hospital for a week, before he returned to duty. The symptoms began to appear, and a second injection was given, and ten days later he was admitted to the base hospital. Four days after admission his skin began to exfoliate, the blood pressure fell, while fever and pulse mounted and the urine output steadily declined. As the exfoliation became more extreme mental hebetude deepened, and coma appeared as he gradually failed. Death occurred thirth-eight days after the first dose of arsphenamin. The following is the author's summary: "1. A fatality followed a therapeutic dose of arsphenamin, the equivalent of less than 3 grains of metallic arsenic. 2. Diarrhea and vomiting were absent during all stages of the intoxication. 3. Nephritis was not a marked feature at any time, and only appeared at the end. 4. There was apparently a decided affinity of the poison for the skin or for the trophic nerves supplying it. From the first to the last all toxic symptoms may be logically ascribed to impairment of skin function. 5. Arsenic was persistently present in the urine. This was remarkable in the absence of accompanying renal inflammation. 6. There was a high leukocytosis and eosinophilia, the latter related closely to the patient's resistance. The height of the leukocytosis followed that of the fever. 7. Arsenic was found at necropsy in every tissue in which it was sought."

BLOOD TRANSFUSION*

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From the earliest dawn of the history of medicine the dream of the transference of blood from animals to man or from man to man has been recorded. To stay the advent of senility or to restore youthful vigor seems to have been a favorite illusion with our ancestors.

Ore[1] claims to have found many references among the early Egyptians to the subject of transfusion. In the light of our knowledge the actual performance of the operation as we now know it was probably not accomplished, or if blood was actually transferred from one individual to another, it was in such small quantities as to be negligible. Even the oft-quoted case of Pope Innocent VIII in 1492, where three boys were sacrificed in a vain attempt to save the life of the prelate, is subject to question, as the actual details are entirely lacking—an oversight not usually found in descriptions of other operations of the same period.

The heterogeneous transfusion, which was repeatedly attempted, all ended disastrously; the reason, of course, is well understood now, but was clouded with mystery at the time.

It was after the appearance of Harvey's epoch-making paper, in 1628, when the circulation was really understood, that intelligent attempts at direct transfusion were made. Lower, a physiologist in the latter part of the seventeenth century, was probably the first to make such an effort, using segments of goose quills to interpose between the segments of vessels of the donor and recipient. Sporadic attempts seem to have occurred from that time, usually resulting disastrously; either due to the clotting, or to improper selection of donors, until the latter part of the last century and the first part of this when use was made of defibrinated blood and more generally of so-called physiological saline solution. But even during this period we get the impression that investigators were not satisfied. Matas[2] in 1891, expressed the situation by stating that while mechanically and physically saline solution rivaled blood, physiologically it could never take its place; he further made the statement "In speaking of blood as a medium for transfusion, we mean, of course, only pure, entire living blood and not the altered pathological material known as defibrinated blood. We also mean blood of the same species and not that derived from heterogeneous sources." Even at that early date he must have had an idea of the incompatability of blood of different species.

It was not until Carrel, who was undoubtedly stimulated by the work of Matas on the surgery of vascular systems, had, after infinite labor, worked out the details of direct anastamosis of vessels by suture, that transfusion began to assume its present place in surgery. The method used was, however, too complicated to come into general use, and too few operators had mechanical dexterity to master its intricate details. Then came the various mechanical devices to facilitate the arteriovenous anastamosis. Chief among these were the Crile's canula, Brewer's tube, Bernheim's methods, and a great many other ingenious devices. All these methods were good, and in the hands of the originators worked very well, but they were too complicated to be generally adopted.

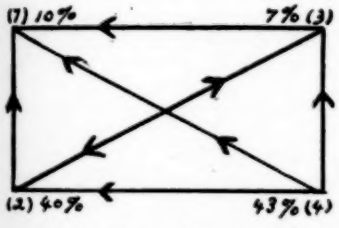
The disadvantages of any direct method of transfusion were very soon evident to those who attempted it; besides the technical difficulties, which were considable with even the simplified operation, the fact that the actual amount of transferred blood could at best be only approximated, caused investigators to turn to less complicated methods. Among the first to render the operation less difficult were Kimpton and Brown's[3] paraffined glass cylinder method; somewhat later Lindeman devised his justly popular syringe method: this was probably

*Read in Surgical Section, Annual State Meeting, Muskogee, May 21, 1919.

the best that had been advocated until that time and within a short time it became very popular. The disadvantages were the number of assistants necessary, the multiplicity of syringes used and the fact that one vein in each donor and recipient was destroyed by the operation. Unger's[4] ingenious two-way-stop-cock apparatus found considerable popularity, but this also was open to the same drawback as the others.

Lewisohn,[5] in a preliminary paper, showed the feasibility of using sodium citrate as an anti-coagulant, and in a more extensive paper[6] gave in detail the method which bids fair to stand the test of time. This sodium salt had long been known as an agent to retard the coagulation of blood, but had been considered too toxic to be available in transfusion. The trouble lay in the fact that in the laboratory a one per cent. solution had been used and this was known to be too large a dosage if used in any considerable amount of blood; but by working in a narrow margin Lewisohn demonstrated that two-tenths per cent. would serve its purpose, and at the same time could be used in 500 to 1000 c.c.'s of blood with absolute safety, provided the proper precautions were observed. It has been claimed that reaction (chills and fever) following the citrate methods are more frequent than after the direct, but this statement seems open to question. Hunt[7] believes the patient's general condition is an important factor in the percentage of post-transfusion reactions; thus he found that pernicious anemia cases had 8.5 per cent higher reactions than when the operation was performed for other conditions. It is well known that the intravenous injection of any foreign substance may be followed by a chill, and it is possible that lack of observation of proper technique in keeping the blood warm may account partially for the reaction following this method.

Hektoen[8] pointed out in 1908, that under special conditions transfusion might prove dangerous, o. ing to red cell agglutination within the vessels of the recipient, and suggested that this might be avoided by selecting a donor whose corpuscles were not agglutinated by serum of the patient. It remained for Moss[9] to work out the iso-agglutinins and iso-hemolysins in detail and later[10] to suggest a practical easy method of determining the fitness of donors in given cases, by grouping. He found that every human falls into one of four groups according to the following modification of Moss' technique, by Sanford.[11]



Moss agglutination groups (modified by Sanford); the corpuscles of the various groups are agglutinated by the serums of the groups from which the arrows lead.

Earlier investigators claimed that tests must be made before each transfusion,[12] but more recently it has been found that each individual remains permanently in his respective group.

It is better to have a donor in the same group as the recipient, but practically it has been found that if the serum of the donor does agglutinate the corpuscles of the recipient and the reverse is not true, no untoward effects will be noted—the serum of the donor being so rapidly diluted by the recipient's blood that agglutination does not occur. The reverse, however, must not occur, i. e. the serum of the recipient must not agglutinate the corpuscles of the donor.

So far nothing has been said about hemolysis, which is really the thing to be feared. Brem[13] pointed out that when hemolysis does occur it was always preceded or accompanied by agglutination. The reverse may not be true, i. e. there may be agglutination without subsequent hemolysis; but for practical purposes

the agglutination test is utilized, owing to its simplicity. Brem,[14] in the same article, modifies Moss' original technique, making it so simple that any but a novice in laboratory work may perform it. It is as follows:

Let 11 represent a known blood belonging to group 2 and x a blood the group of which must be determined. Five or six drops of 11 blood are collected in a small clean dry test tube or centrifuge tube, and one or two drops, according to the size of the drops, in another tube containing 1 c.c. of 1.5 per cent. sodium citrate in 0.9 per cent salt solution, which gives one approximately a five per cent. suspension of corpuscles. The percentage does not have to be exact. The x blood is collected in the same way in two similar tubes. The bloods in the dry tubes are allowed to coagulate, the coagulum is loosened from the side of the tube with a platinum wire, and the tubes centrifugalized to separate the serum. Serum and corpuscles are now ready for the tests. Platinum loopfuls of serum and corpuscles are placed on coverslips, which are inverted over an ordinary cell slide rimmed with petrolatum. Two loopsful of serum are used and one of corpuscle suspension. The slides are gently rolled from side to side to agitate the corpuscles in order to bring them into contact with each other. Agglutination, if it occurs, takes place at room temperature within five minutes. It can usually be detected with the naked eye, showing as brick red particles, but should be examined, also, with the low power objective of the microscope. Rouleaux formation of red corpuscles must be differentiated from small clumps due to agglutination.

In emergency it is not necessary to group patients and the only test necessary is to see that the serum of the recipient does not agglutinate the cells of the donor. Referring to the above table (Sanford's) we see that group four corpuscles are not agglutinated by the serum of any other group. So anyone doing any considerable amount of surgery should have in readiness a few professional donors of this group for emergency purposes. They can easily be secured for a consideration. Of course one must be careful to prevent the transmission of syphilis by having frequent Wassermanns.

This technique may sound complicated but in reality it is very easy, especially if one has a known group of serum and corpuscles to start with. We are prepared to furnish these to any one who desires.

The beneficial effects of transfusion in so many pathological states are so well understood that it would be superfluous to recount them. It is sufficient to say that great good has been accomplished in our hands in secondary hemorrhages, shock, pellagra and pernicious anemia. In the hemolysis that accompanied the recent influenza epidemic it seems to us that transfusion would have been of great benefit. Unfortunately we only tried it on one case which was practically moribund. She improved after the first transfusion but the second failed to revive her and the case ended fatally. Should the occasion again occur, and the time permit, we shall again attempt the operation.

Cases with bleeding fibroids, where the hemoglobin is under forty per cent after one or two transfusions, are quickly changed from exceedingly poor operative risks to ones that stand surgical intervention well.

Of course, cures are not expected in cases of pernicious anemia, but nothing so rapidly causes amelioration of symptoms and a remission of disease as this agent.

As mentioned above, we have tried transfusion in pellagra, choosing only those desperately ill and in whom all other agents were unavailing. The benefits are so prompt and apparently lasting that we feel great encouragement in this form of therapy.

It has been suggested that the causes for failure in skin and bone graft, where it is not autogenous, may be due to the difference in grouping. We have not tested this but will in the near future.

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CLINICAL REPORT OF OPERATION ON FRACTURE OF PATELLA.

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On April 5, 1919, F. M. K., age 65, injured in an automobile accident, sustained numerous abrasions and contusions distributed over his entire body and a comminuted fracture of the left patella.

After the customary examination, including x-ray, emergency attention was given, immobilization on long posterior splint, bandage from the foot up, figure-of-eight about the knee, elevation of entire extremity, rest in bed, and application of ice cap. However, leg continued to swell about the knee joint on the following day accompained by much pain, and an operation was decided upon at once and was performed in the following manner, which has given very satisfactory results in other cases as well as this; however, it is not always desirable to operate on these patients at once although the tendency of the time would seem to suggest earlier operations than formerly.

(a) The leg and thigh having been thoroughly cleansed and made as nearly aseptic as possible, a horseshoe incision was made exposing the comminuted patella.

(b) Under the most rigid asepsis, and without hand contacting, blood clots were removed from the edges of the patella and from the cavity and all hemorrhage thoroughly controlled.

(c) The internal and external lateral ligaments were each united by two interrupted chromic catgut sutures. Fragments of patella were approximated by matress sutures of kangaroo tendon introduced as follows: drill was held obliquely so that it emerged on the fractured surface in front of the articular cartilage, not entering the cavity, and the capsule was closed by use of continuous chromic catgut.

(d) External wounds closed and an immobilizing posterior splint applied and patient returned to bed with extremity elevated.

Patient made an uninterrupted recovery and at the end of six weeks was able to get about with the aid of a cane and has at this time a functionally good leg.

Points of danger are: (a) Sepsis and subsequent stiffness, or (b) Possible loss of leg. (c) Possible loss of life.

These may be avoided as a rule by: (a) The enforcement of the most rigidly aseptic technic. (b) By avoiding all hand contacting of the wound. (c) By not traumatizing the tissues by rough or needless manipulation.

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Local news of possible interest to the medical profession, notes on removals, changes in address, deaths and weddings will be gratefully received.

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EDITORIAL

VACATION AND OUTING DANGERS.

Natural tendencies of mankind, attractively aided by alluring pictures and literature of transportation companies and resorts, cause a pardonable longing for the cool spots depicted to the restless reader. He is especially fond of the pictures showing a tent by a lake or stream, the camp fire and boat conveniently near and his companion landing trout or bass. Blithely he plans for weeks his trip to the woods, thoughtless of the very common dangers sure to confront him.

Camping out in Oklahoma, except in cold weather, is one of the most dangerous procedures we may undertake. Physicians easily recall from experience the trail of typhoid and malaria brought back home by the vacationists.

Physicians have the opportunity to safeguard their clientele, however, by insisting on very simple precautions of a preventive nature.

Tents can be made mosquito proof, often they are not, and they are not wholly protective against the ever-present anopheles along our streams, so the nightly harmless dose of quinine as a routine should be advised with fair assurance of protection from serious illness.

Foods of every class, cool well water, the farmer's milk and fruits are an ever-present danger to the country visitor. The amount of prevalent ignorance of the fundamental means of food protection, care and transportation in our rural districts is appalling. One only has to visit and observe the neglect of very well known means of protection to realize the danger. Against these dangers there are two means of protection. The first, vaccination, is practically a dead letter to most of our people despite the brilliant results shown by our army experience. The second, sterilization of all food supplies, is either unknown, ignored or so carelessly done as to increase the menace by the sense of false security.

Timely warning will obviate a great deal of malarial and typhoid infection if the simplest rules are followed. The difficulty lies in lack of interest of those concerned and their inability to receive advice. The whole matter is one of the problems of the hour to physicians and health officers.

CURRENT MEDICAL LITERATURE

Conducted by

DR. CHAS. W. HEITZMAN, Barnes Building, Muskogee

Contributions and observations of Oklahoma physicians collected by them in the course of study of American and foreign medical literature, deemed to be of sufficient interest and value to the profession, are especially invited to this department. Such contributions should bear the name of the sender, which will be appended to the abstract or omitted, as desired.

COMPULSORY HEALTH INSURANCE.

(*Pennsylvani Medical Journal.* June, 1919).

To deprive any citizen of the privilege of putting his life in the hands of a physician of his choice is un-American and it is equally un-American to compel a physician to attend a person in sickness when for a good reason he would like to be excused. If a man must submit his life to the dictates of a bureaucracy, such a man is robbed of his liberty and independence as it is related to that which is above all things sacred to him.

Where is the justice or equity of discriminating legislation that would advocate a bureaucracy to control and dominate the members of the medical profession to the extent that such beuraucracy shall determine the personnel of a physician's clientele and the fee he may charge regardless of the qualifications attained and the specially skillful service rendered? One cannot be in sympathy with such a contemptible statewide lodge practice. Why should the members of the medical profession who at present rank in qualifications with that of any other profession or calling, be commercialized at the instigation of comparatively few apparently self-appointed ultra enthusiasts who pose as deeply interested in the physical welfare of the people of our commonwealth and who do not see fit to apply the same principle in every other line of human endeavor? It is just as un-American for a bureaucracy to determine the clientele of a physician as it would be to determine the clientele of a butcher, a baker, or a candlestick maker. There is no difference in the application of the principle.

The physical welfare of our people was never so well taken care of as now. Preventive medicine has made tremendous progress and is the outgrowth of work accomplished by the organized medical profession. Nowhere in our country was it the result of the importation of any foreign scheme that has brought ruin to the profession wherever adopted. This whole propaganda appeals to one as artful sophistry, a species of Michiavelianism. G. E. H.

BLOOD TRANSFUSION.

B. M. Bernheim, Baltimore (*Journal A. M. A.*, July 19, 1919), lays stress on the importance of actual blood transfusion which experience in the recent war has taught him. We have, he thinks, too often been told that it is the rarest thing for a patient to bleed to death, and that only a salt or gum infusion is necessary in urgent cases, and they will do all that blood can do. He says would that that were so: there would have been many fewer deaths among our soldiers in France, if it were. He questions the sustaining power of the rise in blood pressure from the gum solution, and while salt solution may be of tempory value it has no sustaining power. Blood on the other hand, has real sustaining power because of its oxygen-carrying properties and irs ability to remain intact as a circulating medium. He quotes striking cases of his own observation, illustrating the points he makes, both of the failure of the substances and of the value of actual blood. At his suggestion, he says, the sodium citrate method was adopted in the American Expeditionzary Forces, and also, at his further suggestion, all transfusion in France was turned over to the medical men; hence, it happens that many of them obtained a wide experience in this valuable line of practice.

PERSONAL AND GENERAL NEWS

Dr. J. H. Barnes, Enid, was seriously ill in July.

Dr. Ney Neel, Mangum, visited Texas points in July.

Dr. Roy Stone, Covington, visited Washington in July.

Dr. J. A. Jeter, Clinton, visited the Rochester clinics in July.

Dr. T. A. Buchanan, Oklahoma City, is visiting Colorado points.

Dr. C. A. Thompson, Muskogee, will take a vacation in Colorado in August.

Dr. A. V. Emerson, Tulsa, has returned from a visit to the Rochester clinics.

Dr. J. S. Hibbard, for many years at Cherokee, has moved to Witchia, Kansas.

Dr. R. A. Gardner, Marietta, has returned from postgraduate work in Chicago.

Dr. A. T. Dobson, Hobart, has been appointed health officer for Kiowa County.

Dr. Ralph Workman, Woodward, is taking his vacation in the mountains of Colorado.

Dr. A. R. Holmes, Henryetta, has returned from an automobile trip to Colorado points

Dr. G. N. Bilby, Alva, has been discharged from the army and assumed his old location.

Drs. E. E. Rice and J. M. Byrum, Shawnee, have returned from a visit to the Rochester clinics.

Dr. W. E. Simon, Alva, has returned from overseas service and is at work in his old location.

Dr. L. E. Pearson, Reed, has been discharged from the army and is back at his old location.

Dr. F. H. Hollingsworth and family, of Okmulgee, are driving to the Northwestern resorts and parks.

Dr. Wm. McIlwain, Lonewolf, visited the home folks in July on a short leave from military service.

Dr. A. W. Harris, Muskogee, has returned from overseas service and resumed his work at his old location.

Dr. C. L. McCallum, Sapulpa, has returned from overseas service, received his discharge and is back at work again.

Dr. J. J. Caviness, Altus, has received his discharge after protracted overseas service and will return to his old location.

Dr. Horace Reed, Oklahoma City, has returned from overseas service and is relocated at 611 State National Bank Building.

Dr. George Hunter, Oklahoma City, has returned to his work after overseas service. He was City Physician prior to his departure.

Dr. J. F. Messenbaugh, Oklahoma City, has returned from several weeks vacation in Missouri, the Rochester clinic and Colorado points.

Dr. C. B. Hill, formerly superintendent of the Supply State Hospital, has moved to Guthrie and is asssociated with Dr. John W. Duke.

Dr. Carroll A. Johnson, Kiowa, has returned from overseas service. Dr. Johnson was flight surgeon attached to the immediate unit of Captain Eddie Rickenbacker.

Dr. T. B. Triplett, Moreland, has been discharged from the army after overseas service and has returned to his home. He has formed a partnership with Dr. T. E. Dixon.

Dr. L. E. Emanuel, Chickasha, has returned from overseas service and assumed his former location. Dr. Emanuel returns a Major and while absent was reappointed health officer of Grady County.

Dr. T. A. Hartgraves, formerly of Soper but for many months attached to Base Hospital Laboratory work in the overseas army, has located in Muskogee and is connected with the Muskogee Clinical and Pathological Laboratory.

Oklahoma Pow-Wow, Oklahoma City, published monthly by the Oklahoma Tuberculosis Association, Edited by Jules Schevitz, Executive Secretary, is a bright little sheet now being issued in the fight against tuberculosis. The organization will mail it to any physician on request, and urgently invites the cooperation of all physicians to make the issues attractive.

Dr. Frank McGregor, Mangum, has returned from overseas service in the army. Dr. McGregor returns with the earned distinction of having received more decorations and honorable mentions for distinguished service than any other Oklahoma physician. He was decorated by the King of England for extradorinary service and valor under fire. He will resume his place and partnership as a general surgeon with Dr. Fowler Border, with whom he was associated before entering service.

DOCTOR G. C. WILTON.

Dr. G. C. Wilton, Ryan, died at his home after a month's illness, the cause of death said to have been cancer of the stomach. Interment was made at Ryan.

Dr. Wilton was born in Lamar County, Texas, March 1, 1859. He was educated in the common schools of Texas and graduated from the Ft. Worth University. He moved to the Indian Territory in 1889, locating at Grady, moving to Ryan nineteen years ago. He is survived by his wife and a son and daughter.

COUNCIL ON PHARMACY AND CHEMISTRY
AMERICAN MEDICAL ASSOCIATION

This report is limited according to the ideas and opinions as to its usefulness and practicability to Oklahoma physicians. A complete report is obtainable upon request from the Council, 535 North Dearborn St., Chicago.

PROPAGANDA FOR REFORM

Collossol Preparations. The Council on Pharmacy and Chemistry reports that Collosol Argentum, Collosol Arsenicum, Collosol Cocain, Collosol Cuprum, Collosol Ferrum, Collosol Hydrargyrum, Collosol Iodin, Collosol Manganese, Collosol Quinin and Collosol Sulphur are inadmissible to New and Nonofficial Remedies because their composition is uncertain. In the few cases in which the therapeutic claims for these preparations were examined, the claims were found so improbable and exaggerated as to have necessitated the rejection of these products on this account. The term "Collosol" appears to be a group designation for what are claimed to be permanent colloidal solutions, marketed by the Anglo-French Drug Company, Ltd., London and New York. Were this claim correct, the Collosols should contain their active constituent in the form of microscopic or ultramicroscopic suspensions. The Council was, however, obliged to question the colloidal character of the preparations. A number of samples submitted to the Council had separated and Collosol Hydrargyrum was not a colloidal solution at all; also the ampules of Collosol Ferrum contained a flocculent precipitate. If either of these two preparations were injected intravenously as directed, death might result (Jour. A. M. A., June 7, 1919, p. 1694).

Pulvoids Calcylates Compound. The Council on Pharmacy and Chemsitry publishes a report on Pulvoids Calcylates Compound (The Drug Products Co., Inc.), not so much because the preparation is of any great importance, but as a protest against the large number of similar irrational complex mixtures which are still offered to physicians. These "Pulvoids" are tablets, each of which is said to contain "Calcium and Strontium Disalicylate 5 grs., Resin Guaiac ½ gr., Digitalis ¼ gr., Colchium (Colchicum) Seed ¼ gr., Squill ¼ gr., Cascarin 1-16 gr. with aromatics." They were advertised among "Approved Remedies for La Grippe and 'Flu'" * * *. The Council admits that salicylates have a field in influenza in that they often afford relief from pain. There is no reason to suppose that a mixture of strontium and calcium salicylate—the calcium and strontium disalicylate of the "Pulvoids" is probably a mixture of strontium and calcium salicylates—has any greater salicylic effect than an equal amount of sodium salicylate. On the other hand it is worse than useless to give colchicum, squill and digitalis for the relief of such pain. No educated physician will give resin of guaiac and "cascarin" in fixed proportions with salicylates (Jour. A. M. A., June 14, 1919, p. 1784).

Antithyroid Preparations (Antithyroidin-Moebius and Thyreoidectin) Omitted from N. N. R. New and Nonofficial Remedies, 1918, contained a discussion of "antithyroid" preparations and described two of these: Antithyroidin-Moebius (E. Merck, Darmstadt, Germany) and Thyroidectin (Parke, Davis and Company, Detroit, Mich.). The "antithyroid" preparations have not realized the expectations of their promoters, and are viewed with skepticism by practicallly all critical clinicians. Consequently, notwithstanding the cautiously worded claims made for Thyreoidectin, the Council voted to omit this preparation from New and Nonofficial Remedies (Antithyroidin-Moebius had already been omitted because it was off the market) (Reports Council Pharm. and Chem., 1918, p. 50).

Borcherdt's Malt Extract With Alteratives. Each fluid-ounce of this was claimed to contain iodin 1-30 grain, calcium iodid 1 grain, potassium iodid 2 grains, calcium chlorid 8 grains. The preparation was declared inadmissible to New and Nonofficial Remedies: (1) because it did not contain free iodin as claimed; (2) because it was needlessly complex, and therefore irrational; (3) because the name of the preparation is not descriptive of its composition, but therapeutically suggestive (Reports Council on Pharm. and Chem., 1918, p. 51).

Cephaelin and Syrup Cephaelin-Lilly Omitted from N. N. R. and Syrup Emetic-Lilly not Accepted. New and Nonofficial Remedies, 1918, described cephaelin (an alkaloid obtained from ipecacuanha root) and listed Syrup Cephaelin-Lilly as a pharmaceutical preparation of it. In 1918 Lilly and Company advised that the name of its preparation had been changed to Syrup Emetic. The Council directed the omission of Syrup Cephaelin-Lilly and voted not to admit Syrup Emetic because the name does not indicate the potent ingredient of the simple pharmaceutical preparation and in that it is therapeutically suggestive. Emetics are powerful agents, and preparations containing them should not be sold under non-informing names. As the cephaelin syrup was the only preparation of cephaelin admitted to New and Nonofficial Remedies and as the alkaloid appears to have no important therapeutic field, the Council also omitted cephaelin from the book (Reports Council Pharm and Chem., 1918, p. 52).

Colalin Omitted From N. N. R. Colalin is a bile salt preparation claimed to consist essentially of hyoglyococholic and hyotaurocholic acids. It is manufactured by Rufus Crowell and Company, Somerville, Mass., and marketed by Schieffelin and Company. An examination of the current advertising for Colalin revealed that claims were made for it which were not in harmony with the known actions of bile preparations. As these claims were not substantiated by evidence nor revised in accordance with a request sent to the manufacturer and the agent, the Council directed the omission of Colalin from New and Nonofficial Remedies (Reports Council on Pharm. and Chem., 1918, p. 52).

Diphtheria Bacillus Vaccine Omitted From N.N.R. The Council directed the omission of diphtheria bacillus vaccine from New and Nonofficial Remedies because the manufacturer of the only preparation of this vaccine advised that its sale had been discontinued (Reports Council Pharm. and Chem., 1918, p. 54).

Empyroform Omitted From N. N. R. Empyroform is a condensation product of birch tar and formaldehyde. The Council voted to omit the preparation from New and Nonofficial Remedies because its usefulness is doubtful and because the agents were not in a position to submit further evidence for its value (Reports Council Pharm. and Chem., 1918, p. 55).

Foral. Foral is a depilatory preparation sold with special claims for its use for the removal of hair prior to surgical operation or the dressing of wounds. The Council declared Foral inadmissible to New and Nonofficial Remedies: because it is an unessential and irrational modification of the well known depilatory composed of barium sulphid 2 drachms, zinc oxid 3 drachms and starch 3 drachms, and because it is marketed under a noninforming name and with unwarranted claims (Reports Council Pharm. and Chem., 1918, p. 55).

NEW BOOKS

Under this heading books received by the Journal will be acknowledged. Publishers are advised that this shall constitute return for such publications as they may submit. Obviously all publications sent us cannot be given space for review, but from time to time books received, of possible interest to Oklahoma physicians, will be reviewed.

The Surgical Clinics of Chicago. Vo.ume III, Number 1 (February, 1919). Octavo of 236 pages, 75 illustrations. Philadelphia and London: W. B. Saunders Company, 1919. Published Bi-Monthly. Price per year: Paper $10.00, Cloth $14.00.

Reconstruction Therapy. By William R. Dunton, Jr., M.D., Assistant Physician at Sheppard and Enoch Pratt Hospital, Towson, Md.; Instructor in Psychiatry, Johns Hopkins University. 12mo of 236 pages, 30 illustrations. Philadelphia and London: W. B. Saunders Company, 1919. Cloth, $1.50 net.

AN OUTLINE OF GENITO-URINARY SURGERY

By George Gilbert Smith, M.D., F.A.C.S., Genito-urinary Surgeon to Out-patients, Massachusetts General Hospital. 12mo of 301 pages with 71 illustrations. Philadelphia and London: W. B. Saunders Company, 1919. Cloth, $2.75 net.

This is a condensed but very practical work on Genito-Urinary Surgery, and is especially directed to the attention of the student and general practitioner. The work is based on the practical experience of the author, the case histories entirely from his private work or his work at the Massachusetts General Hospital. The illustrations are liberal and clear and from actual operations or specimens.

THE HEALTH OFFICER

By Frank Overton, M.D., D. P. H., Sanitary Supervisor, N. Y. State Dept. of Health, and Willard J. Denno, M. D., D. P. H., Medical Director of the Standard Oil Company. Octavo of 512 pages with 51 illustrations. Philadelphia and London: W. B. Saunders Company, 1919. Cloth, $4.50 net.

This is a very readable work with unique and interesting features especially in the illustrations. The author thought, and we hold with him, that the plainest primary fundamentals of disease dissemination may be "Greek" to some of our profession. Experience in actual practice shows that an alarming percentage of doctors have either never learned the practical application of common knowledge of growth and spread of disease or ignore it and neglect it to the discredit of the medical profession. With this idea in view he has inserted original drawings of accepted ideas on the subjects. They show the diseases and their sources of growth directly or indirectly.

The problems and relations of the health officer in general are thoroughly considered in the text. The work is so plainly written that it should be useful to everyone interested, whether physician, nurse or otherwise.

QUARTERLY MEDICAL CLINICS.

A Series of Consecutive Clinical Demonstrations and Lectures. By Frank Smithies, M. D., Augustana Hospital, Chicago. Volume 1, Number 1, January, 1919, Published by Medicine and Surgery Publishing Company, Metropolitan Building, St. Louis. Annual Subscription, paper $5.00; cloth $8.00. Single copies $1.50 in paper; Quarterly $2.50 in cloth.

This quarterly is a carefully edited report of the clinics and lectures given senior students of the School of Medicine of the University of Illinois at the Augustana Hospital. Formerly stenographic

reports were taken, mimeographed and given to the students. After repeated suggestion from visiting physicians that they be published and issued in consecutive order the work was undertaken and is now presented. The cases covering three months past. It is the aim to issue such a publication each quarter in the future.

The editor offers no excuse for the fact that some of the work is elementary, but advances the opinion that in teaching medical men very little must be taken for granted, that the simplest clinical and laboratory examination methods are often not clearly understood.

The subjects are those of every class presented for treatment at the hospital. Full histories, physical examination, special examination, x-ray examination, if any, discussion of the case, treatment, with any special suggestion as to techinc and all other practical phases are given.

The work seems to be as valuable as were Murphy's Clinics to the student and practitioner. The illustrations are profuse and to the point.

DIET IN HEALTH AND DISEASE

By Julius Friedenwald, M.D., Professor of Gastro-Enterology in the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore; and John Ruhrah, M.D., Professor of Diseases of Children in the University of Maryland and College of Physicians and Surgeons, Baltimore. Fifth edition, thoroughly revised and enlarged. Octavo of 919 pages. Philadelphia and London: W. B. Saunders Company, 1919. Cloth, $6.00.

This is a painstaking work covering closely every phase of diet affecting the organism. Elaborate tables, food values, diseases in which diet is a primary factor, diets adaptable to the healthy and the sick child, diseases caused by errors in diet, diet for the aged, in disease, in infections, in diseases of the stomach, liver, respiratory organs, circulatory system, genito-urinary system, nephritis, the nervous system, deficiency diseases, unclassified diseases, diseases of the skin, special diets as salt-free diets, etc., dietetic management of surgical cases, army and navy rations, prison and hospital dietaries and many other rare, but sometimes important conditions. Beverages, including lime water, milks, brandy and egg and allied mixtures of alcoholic content, fruit juices are noted. Cereals of every type, breads and vegetables have a place.

The work must be consulted to appreciate its thoroughness in every detail. Every physician should have the book near his desk for ready reference for the subjects embraced are those more often demanding attention than any other. It is a noticeable fact that works on diet and its many intricacies are those most often sought by physicians and intelligent patients from the library. The exacting details are too numerous to be remembered when needed, so it is necessary to constantly refresh the mind on them. This is the last word on the subjects.

SURGICAL TREATMENT

A Practical Treatise on the Therapy of Surgical Diseases for the Use of Practitioneers and Students of Surgery. By James Peter Warbasse, M. D., Formerly Attending Surgeon to the Methodist Episcopal Hospital, Brooklyn, New York. In three large octavo volumes, and separate Desk Index Volume. Volume III contains 861 pages with 864 illustrations. Philadelphia and London; W. B. Saunders Company, 1919. Per set (Three Volumes and the Index Volume): Cloth $30.00 per set.

This volume contains chapters on the Treatment of Hernia, their complications and forms; The Rectum and Anus; The Appendix, Liver and Gall-Bladder, the Genito-urinary organs, including the kidneys, uterus, suprarenal glands, bladder, prostate, penis, urethra and accessory organs; the testicles and scrotum, spermatic cord and testicles; vulva, vagina, uterus, ligaments, tubes, ovaries, etc. It also contains matter on the upper extremeties, not disregarding the too often lightly considered and unappreciated possibilities of felon, paronychia, cellulitis of the fingers, carbuncles, especially stressing the importance of proper treatment of the deep infections of the fingers, hands and arms. The lower extremeties are considered in like manner; their every conceivable abnormality being noted. Amputations in the light of the best end results are most thoroughly discussed. Plastic surgery and its incident indicated operations, electricity and radium, electric injuries are well noted. Many other fundamental conditions are noted.

"The Economics of Surgical Treatment" is a remarkably condensed statement of the practical problems confronting the profession. Under the head of "Surgical Practice Under Competition," "Surgical Practice Under the State," "Surgical Practice Under Group Experts" (The Mayo Clinic as an illustration), "Surgical Practice Under Co-operation" and "The Ultimate Needs and Destiny of Surgery"—a message full of import is written. The too long ignored fact, menace or inevitability of the injection of so-called socialistic methods, economic organizations of people, possibly some form of unionization applicable to medicine is recognized. But, in the statement that "Society will ever demand a special class who shall study the problems of human health . . ." is the barrier separating medicine, the most important of all sciences affecting modern life from the ordinary rules of organizations whose object is to demand the highest obtainable intrinsic reward for service rendered their fellows.

This volume completes the trio of works on surgery by Warbasse. It seems fair to say that the entire work is the most complete yet issued on the problems and work of the surgeon.

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Woodward		